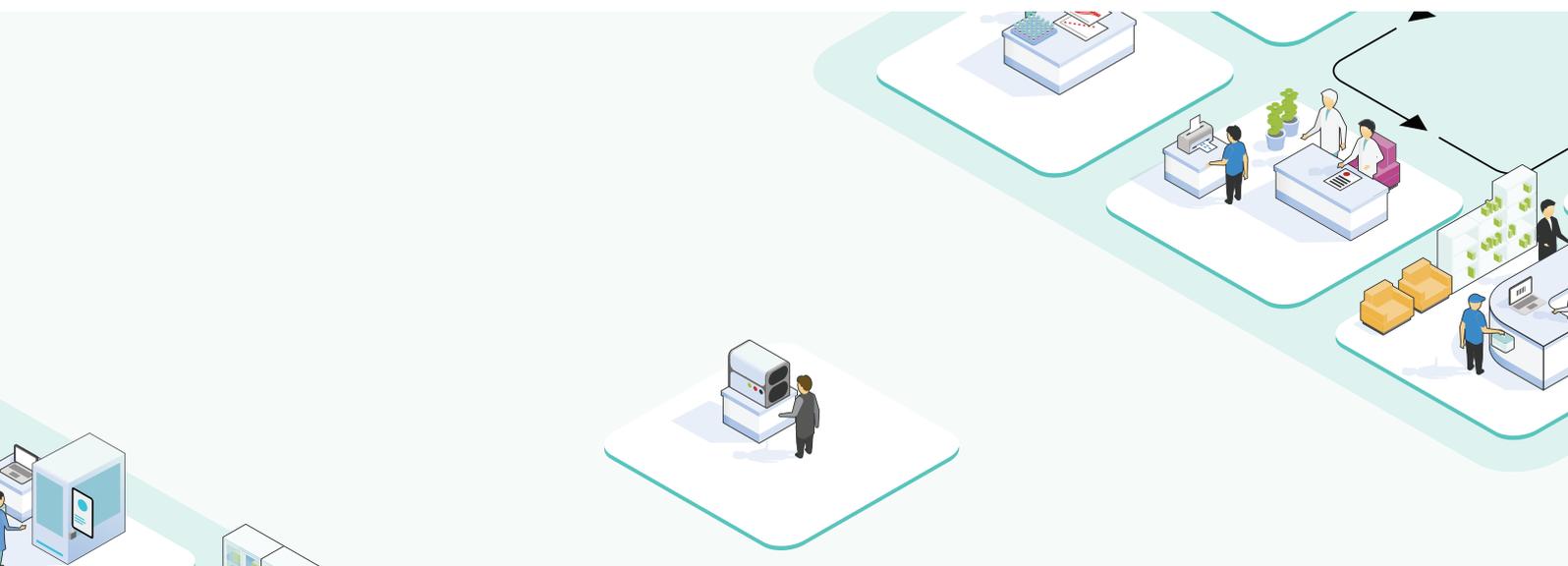
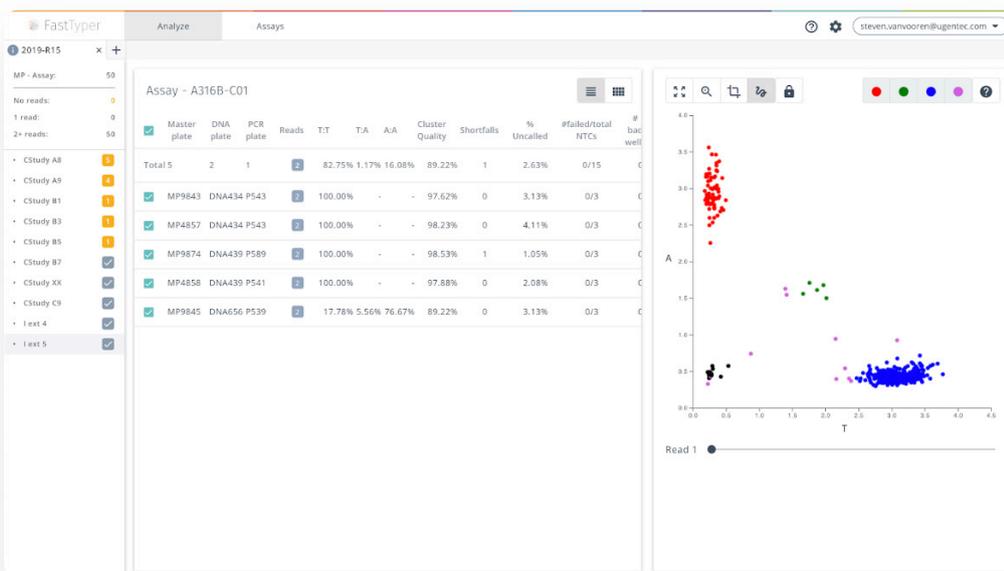


APPLICATION NOTE

Intelligent software to accelerate and standardize your genotyping workflow

In a nutshell:

1. Scale up your crop, seed & animal genotyping orders
2. Get reliable results & genotype with confidence
3. Implement a smart, automated platform



A scalable genotyping platform

In a setting where you process millions of data points, every second saved matters. All data that need to be reviewed in context, are grouped and displayed in a single, comprehensive overview.

As an example, FastFinder Genotyper conveniently allows you to visualize multiple reads of a plate, and shows a full overview of genotype status and data quality & calling exceptions across all plots for the entire assay.

Get results in fewer clicks

Genotyper saves the genotyping expert time by reducing the manual work on cluster calling. Easily analyze calls across multiple plates in one comprehensive visual overview, and look at many assays at a glance.

Focus on essentials - skip easy plates

With Genotyper, you'll only look at data that needs your attention - the software will perform automated calling, and only highlight what you need to see. You can still zoom in and see every detail, but it no longer requires eyes on all plots, samples, and genotype calls.

While automated analysis tools are in place in most genotyping labs, the approach is far from hands-off: insufficient confidence means all results still have to be reviewed, in addition to a lot of manual scoring. In comparison to this status quo, Genotyper automates selectively. This means if an accurate result cannot be guaranteed, the data will immediately be presented to the user for expert review. Conversely, on data that Genotyper automatically calls, it offers accuracy of 99% and up, allowing you to skip the bulk of data review and focus on only those plots that are challenging enough to warrant eyes-on time, where complex biology is at play or wet-lab errors need attention.

Great software user experience

Genotyper embraces the latest technology



in software user interface design. This translates into a modern software platform with excellent usability, snappy interfaces as well as interactive, visual data representation and fast visualization of thousands of data points in a single view.

Reliable results

Genotyper performs automated calling, and will only flag results that require manual review. In addition to increased efficiency, users will gain confidence in relying on the algorithm having called the bulk of the data points automatically and with high confidence.

The software also reduces the risk of human error, through its simplified workflow, convenient overviews for entire assays, and automated calling capabilities.

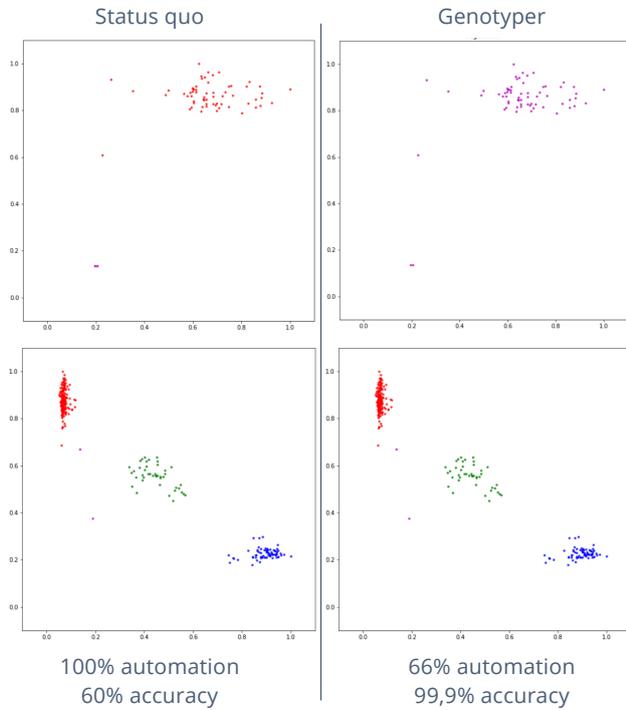
A smart platform

Smarter methods. Unlike simple, traditional algorithms, Genotyper algorithms employ complex data heuristics to accurately analyse your genotyping data. Using the latest of intelligence data science techniques, these algorithms offer a robust performance out of the box and can be tweaked to better suit specific data analysis challenges. Easy configuration of the underlying algorithms allows the software to be fine-tuned to your specific study pipeline, further boosting calling confidence - and hence time efficiencies - you will obtain.

How the software works

Selective automation

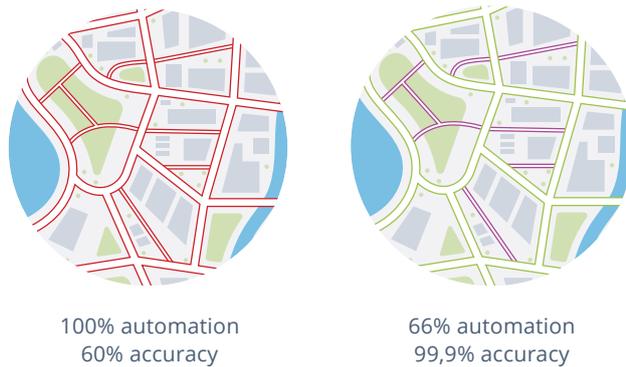
The previously mentioned selective automation is an important trait of Genotyper algorithms. In comparison to status-quo data analysis pipelines, Genotyper knows when to automate



and when not to automate. This allows users to trust the software to do the right thing.

In analogy to self-driving cars: The status-quo self-driving car has an always-on automation mode, it chooses to drive without user interference 100% of the time. On more challenging roads, smaller roads without roadmarks or other signals, it has collisions and makes errors.

The new, Genotyper-like, autonomous vehicle chooses to only drive autonomously on roads of which it can drive with high precision and zero

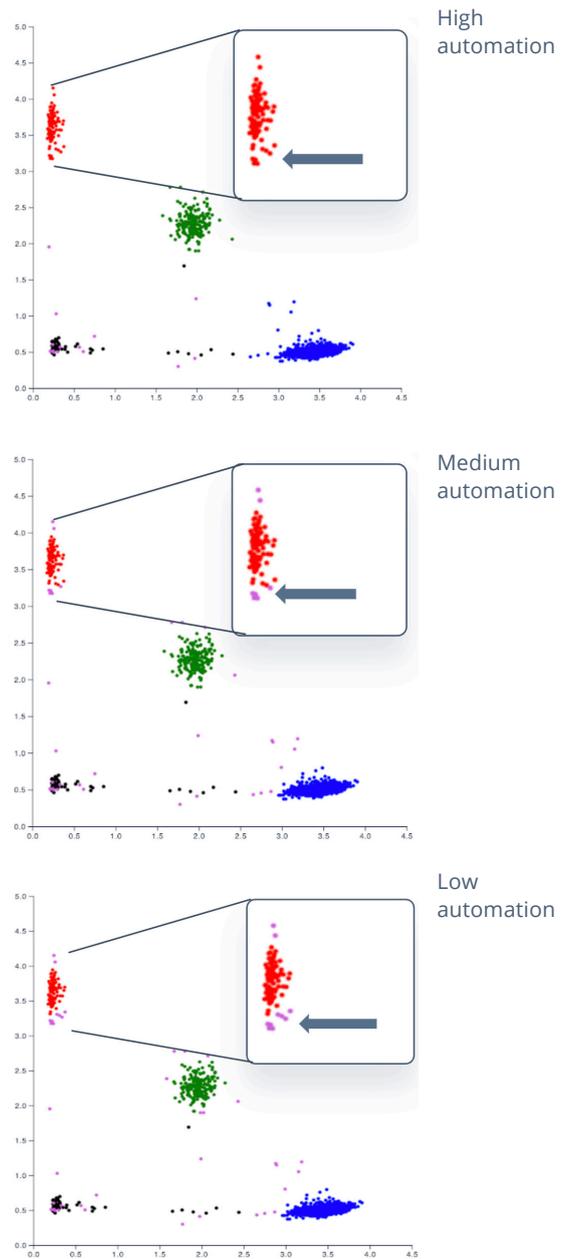


collision (or errors). On more challenging roads, it hands the wheel to the human driver.

Control automation

Whether you're running genotyping experiments and QC, you're always in control of the automation level of Genotyper.

With three different modes, you can choose how wide the software calls data points in clusters.



SES Vanderhave & Genotyper early studies

A number of at-scale genotyping pilot projects included running the FastFinder Genotyper algorithms against large amounts of data. These initial studies were performed with multiple currently undisclosed high-volume genotyping laboratories. SES Vanderhave's data, an early adopter of the platform, can be found below.

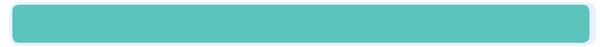
The samples tested included multiple different (diploid) vegetable seeds. More than 1500 1536-well plates, were compared to the human data

Summary



Total plates: >1500

Overall precision: >99,5%



Overall automation rate: >86%



1300+ plates automated

200+ untried

Unlike the current status quo, FastFinder offers us **robust and precise automation**. We can rest easy that the bulk of our data is analyzed automatically and accurately, and jump in when the software detects anomalous results.

Glenda Willems, Head of Genotyping & Bioinformatics at SES Vanderhave

Conclusion

Today, FastFinder already automates considerable parts of our data analysis workflow, saving SES Vanderhave staff amounts of time on data analysis.

Over the next months, UgenTec & SES Vanderhave

will continue to iteratively collaborate on co-developing this automated genotyping data analysis software.

Want to try FastFinder Genotyper for your data?

We can set up FastFinder to automate some of your historic data. This gives you a clear picture of what the automation can mean for you.

Visit www.ugentec.com to request a demo on your data.